

**What is claimed is:**

1. A method for the preparation of a highly uniform nano-scale paclitaxel solid dispersion by a supercritical fluid process which comprises:

- 5      1) preparing a mixture of paclitaxel and a pharmaceutically acceptable additive and dissolving in a mixed organic solvent to obtain a solution mixture;
- 2) forming particles of the mixture of paclitaxel and the pharmaceutically acceptable additive by spraying the solution mixture of Step 1) to the supercritical fluid to bring into contact with each other;
- 3) removing the organic solvent by washing the particles with a fresh batch  
10     of the supercritical fluid; and
- 4) recovering the particles prepared thereby.

2. The method of claim 1, wherein the additive is a hydrophilic polymer or a surfactant.

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3. The method of claim 2, wherein the hydrophilic polymer is one or more selected from the group consisting of hydroxypropylmethylcellulose (HPMC), polyvinylpyrrolidone, hydroxypropylcellulose (HPC), hydroxyethylcellulose (HEC) and Eudragit.

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4. The method of claim 2, wherein the hydrophilic polymer is employed in an amount ranging from 0.1 to 20 weight part based on 1 weight part of paclitaxel.

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5. The method of claim 2, wherein the amount of the hydrophilic polymer in the solution as a solvent-free basis is in the range of 1 to 75 % (w/w).

6. The method of claim 1, wherein the mixed organic solvent is prepared by mixing two organic solvents, one being capable of dissolving paclitaxel and the other being capable of dissolving the additives.

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7. The method of claim 6, wherein the two organic solvents are mixed in a weight ratio ranging from 7:3 to 5:5.

8. The method of claim 6, wherein the organic solvent for dissolving paclitaxel is selected from the group consisting of dichloromethane, chloroform, carbon tetrachloride, ethylacetate, N,N-dimethylformamide, dimethylsulfoxide and tetrahydrofuran.

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9. The method of claim 6, wherein the organic solvent for dissolving the additive is selected from the group consisting of ethanol, methanol and isopropanol.

10. The method of claim 1, the supercritical fluid is contacted with the solution mixture containing paclitaxel and the additive under the condition of 35 to 70°C and 80 to 200 bar.

11. A paclitaxel solid dispersion prepared by one of the methods of claims 1 to 10.

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12. The paclitaxel solid dispersion of claim 11, which shows a thermochemical property determined by differential scanning calorimeter (DSC) different from that of a paclitaxel powder.

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13. A pharmaceutical composition of paclitaxel for oral and injection administration, which comprises the paclitaxel solid dispersion of claim 11 as an effective ingredient.